PHYSICS: GENERAL EMPHASIS (BA)

Program Description

When you major in Physics, you study the changes, interactions, and properties of matter and energy. As a result, you learn how physics strongly influences humankind's understanding of nature and how engineers create new technology based on the principles first discovered by physicists, contributing to the social economics and changes.

The General Emphasis option is suited for you if you are majoring in another science, math, or engineering discipline.

Entering and Completing the Major

In order to earn a degree, you must complete at least one academic major. SPU encourages students to explore various academic paths, so if you change your mind about a major, or want to include an additional program, you are able to do so, as outlined below.

Note that the University encourages you to enter your chosen major(s) as soon as you have determined it and are eligible to join it, especially by the start of your junior year. Students who transfer as juniors and seniors should enter a major within their first two quarters at SPU.

- If this is your first quarter at SPU and you identified a major in this department as your first choice on your application for admission to the University, you have gained entry to the major. To change or add a major, follow these instructions (https://spu.atlassian.net/l/cp/a3th1keb/).
- If you are an SPU student with an SPU cumulative GPA of 2.0 or better, follow these instructions (https://spu.atlassian.net/l/cp/a3th1keb/) to enter a major in this department.
- The University requires a grade of C- or better in all classes that apply to a major; however, programs may require higher minimum grades in specific courses. You may repeat an SPU course only once for a higher grade.
- To advance in this program, meet with your faculty advisor regularly to discuss your grades, course progression, and other indicators of satisfactory academic progress. If your grades or other factors indicate that you may not be able to successfully complete the major or minor, your faculty advisor can work with you to explore options, which may include choosing a different major.
- You must complete the major requirements that are in effect in the SPU Undergraduate Catalog for the year you enter the major.

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68 Credits Minimum, Including 31 Upper Division (UD)

Code	Title	Credits
Introductory Classes		
Select one of the following Groups:		15
Group A:		
PHY 1101	General Physics	
PHY 1102	General Physics	
PHY 1103	General Physics	
Group B:		
PHY 1121	Physics for Science and Engineering	
PHY 1122	Physics for Science and Engineering	
PHY 1123	Physics for Science and Engineering	
PHY 2321	Intermediate Physics	5
Section Credits Required		20
Math		
MAT 1234	Calculus I	5
MAT 1235	Calculus II	5
MAT 1236	Calculus III	5
MAT 2401	Linear Algebra	3
MAT 3237	Differential Equations	3
Section Credits Required		21
Required Lab Classes		
PHY 3311	Experimental Methods I	3
PHY 3312	Experimental Methods II	3
Section Credits Required		6
Required Upper Division		
ME 3400	Dynamics	3
or PHY 3110	Mechanical Modeling and Analysis	
ME 3500	Thermal Science I: Thermodynamics [1,2]	3
or PHY 3401	Thermal and Statistical Physics	
PHY 3315	Electricity and Magnetism I	3
PHY 3341	Quantum Mechanics	5
PHY 4898	Physics Capstone	1
PHY 4970	Undergraduate Research	1
Section Credits Required		16
Electives		
Select 5 credits of the following, including UD to reach 31 and 68 total:		5
EGR 3611	Appropriate and Sustainable Engineering I: Alternative Energy Systems	
PHY 3011	Global Climate Change: Scientific, Social and Moral Implications	
PHY 3211	Acoustics	
PHY 4101	Astrophysics of Stars	
PHY 4311	Optics and Lasers	
PHY 4315	Electricity and Magnetism II	
PHY 4340	Quantum Mechanics II	
PHY 4520	Preparing to Teach	
PHY 4900	Independent Study	
PHY 4940	Internship in Physics	
PHY 4950	Special Topics in Physics	
PHY 4970	Undergraduate Research	
Section Credits Required		5
Total Credits		**68**

1 If not used for Required UD, ME 3500 may be used as Elective

2 If not used for Required UD, PHY 3401 may be used as Elective

Suggested Course Sequence

Course	Title	Credits
First Year		
Autumn		
PHY 1121	Physics for Science and Engineering	5
MAT 1234	Calculus I	5
UCOL 1000	University Colloquium	1
	Credits	**11**
Winter		
PHY 1122	Physics for Science and Engineering	5
MAT 1235	Calculus II	5
	Credits	**10**
Spring		
PHY 1123	Physics for Science and Engineering	5
MAT 1236	Calculus III	5
	Credits	**10**
Any Quarter		
WRI 1000	Academic Inquiry and Writing Seminar	5
WRI 1100	Disciplinary Research and Writing Seminar	5
UFDN 1000	The Christian Faith	5
	Credits	**15**
Second Year		
Autumn		
PHY 2321	Intermediate Physics	5
PHY 3311	Experimental Methods I	3
MAT 3238	Vector Calculus	3
PHY 4520	Preparing to Teach [1]	2
	Credits	**13**
Winter		
PHY 3312	Experimental Methods II	3
PHY 4520	Preparing to Teach [1]	2
	Credits	**5**
Spring		
MAT 2401	Linear Algebra	3
PHY 3313	Experimental Methods III [1]	3
PHY 4520	Preparing to Teach [1]	2
	Credits	**8**
Any Quarter		
UFDN 2000	Christian Scripture	5
UCOR 2000	The Emergence of the Modern Global System	5
	Credits	**10**
Third Year		
Autumn		
PHY 3315	Electricity and Magnetism I	3
EGR 3611	Appropriate and Sustainable Engineering I: Alternative Energy Systems [1]	5
	Credits	**8**
Winter		
PHY 4311	Optics and Lasers [1, 2]	5
	Credits	**5**
Spring		
PHY 3011	Global Climate Change: Scientific, Social and Moral Implications [1, 3]	5
	Credits	**5**
Any Quarter		
UFDN 3100	Christian Theology	5
UCOR 3000	Faith, Philosophy, and Science	5
	Credits	**10**
Fourth Year		
Autumn		
PHY 4898	Physics Capstone	1
	Credits	**1**
Winter		
PHY 4898	Physics Capstone	1
PHY 3401	Thermal and Statistical Physics [2]	3
	Credits	**4**
Spring		
PHY 3110	Mechanical Modeling and Analysis [2]	3
	Credits	**3**
	Total Credits	**118**

1

These are examples of elective courses. 18 credits required.

2

Courses are taught every other year.

3

PHY 3011 Global Climate Change: Scientific, Social and Moral Implications can count as a WE course or a UD elective, but not as both usless a student is a double major and PHY 3011 is not required for the other major.

4

During your sophomore thorugh senior years, you should take the following courses.

- WE course (3 credits)
- CUE course (3 credits)
- WK Arts (5 credits)
- WK Humanities (5 credits)
- WK Social Science (5 credits)